

REMARKS

INTRODUCTION

In accordance with the foregoing, claims 1 and 2 have been amended. Claim 47 has been added. Claims 1-47 are pending and under consideration.

CLAIM REJECTION – 35 USC 112

Claims 1-11 were rejected under 35 USC 112, second paragraph, as being indefinite. Appropriate correction has been made to claims 1 and 2.

Withdrawal of the foregoing rejection is requested.

CLAIM REJECTION – 35 USC 102

Claims 1-46 were rejected under 35 USC 102(b) as being anticipated by Nelson et al. (US 6,723,174) (hereinafter "Nelson").

Nelson discloses an automated semiconductor processing system. In one embodiment of Nelson, an operator carries a pod 815 to the loader 824. The pod 815 is placed onto the load elevator 838. The elevator 838 lowers the pod from the up or load position 844 to the down or indexer position 846. Wafers 818 are enclosed, and generally sealed within the pod 815, to protect the wafers 818 from contamination and damage during handling and movement. A pod door 816 closes or seals off the open front end of the pod 815. Nelson, 18:30-18:43 and Figures 32, 33 and 35.

With the pod 815 at pod position AA, the conveyor section 850 supporting the pod 815 is actuated. The drive rollers 852 drive the pod 815 rearwardly, while the idler rollers 854 help to support the pod 815, thereby moving the pod 815 from the conveyor section 850 to pod position K in the indexer 826. The drive rollers 852 at position K in the indexer 826 are also actuated to help complete this movement. The conveyor sections 850 are at the same vertical level as the indexer conveyors 864 and 866, as well as the docking elevator conveyors 902. Nelson, 18:44-18:54.

As each subsequent pod 815 is loaded, the drive rollers 852 in the conveyor 864 in the load row 860 of the indexer 826 are actuated. Thus, the pod 815 at pod position K is moved by the conveyor 864 to position L, while the pod at position AA moves into position K. The pod in position L then moves to position M, followed by subsequent pods, and then into position R. The

movement of the pod 815 from position M to position R, onto the docking elevator conveyor 902 is performed in the same way as the movement of the pod 815 from position AA to position K, i.e., the drive rollers 852 in the conveyor 864 are actuated in coordination with the drive rollers 852 in the docking elevator conveyor. Nelson, 18:57-19:4.

The elevator 900 then lifts the pod 815 off of the conveyor 902 and raises the pod vertically up to the docking station 828. Once the pod 815 is raised to the level of the docking station 828, the engager actuator 912 moves the pod 815 forward, so that the front surface of the pod contacts the docking wall 914, to dock the pod. The pod door remover 930 engages the pod door 816 through the opening 916 in the docking wall 914. Suction cups on the pod door remover 930 hold the pod door 816 onto the pod door remover 930, while keys extend into the pod door 816 and rotate, to unlock or release the latching mechanism that holds the pod door 816 onto the pod 815. The pod door remover 930 then moves forward, carrying the pod door 816 with it through the opening 916. The pod door remover 930, carrying the pod door 816 then moves down through the door slot 934. The front of the pod 815 is then opened to the process space 822. Nelson, 19:5-19:23.

The transfer robot 970 in the transfer station 830 moves so that the end effector 976 on the articulated arm 974 moves through the opening 916 to engage a wafer 818 within the pod 815. The robot 970 withdraws the wafer 818 from the pod 815 and places the wafer into the carrier 990. The robot 970 may pass the wafer over a scanner 980 to allow the controller to identify the wafer. Nelson, 19:24-19:30. and Figure 33.

The transfer robot 970 transfers wafers between the pod 815 in row CC and the carrier 990 in row CC which is aligned with that pod, in the longitudinal direction. The transfer robot 970 continues transferring wafers from the docked pod 815 to the carrier 990, until all wafers have been transferred from the pod 815. Nelson, 19:33-19:44.

With the carrier 990 now loaded with wafers 818, the process robot 1000 moves to engage the loaded carrier 990. The robot 1000 moves laterally on the rail 1002 so that the robot arm 1004 is adjacent to the carrier 990. The arm 1004 then moves vertically down, with the fingers 1006 engaging into the slots 1007 of the carrier 990. The robot arm 1004 then lifts the carrier 990 off of the deck 932, pivots the carrier 990 clockwise, moves the carrier 990 forward (towards the front wall 806) and then moves the carrier 990 laterally along the rail 1002, to a position in alignment with the rotor 1040 in one of the process chambers 1020 or 1030. Nelson,

19:46-19:67 and Figures 43, 44 and 45.

After the door of the process chamber 1020 or 1030 is open, the robot 1000 moves the carrier 990 into engagement with the rotor 1040. The securing device 1008 is released or withdrawn, the arm 1004 is pulled back out of the chamber 1020 or 1030, the chamber door is closed, and the wafers 818 are processed. Nelson, 20:1-20:8 and Figures 46, 47 and 48.

Claims 1, 12, 24 and 35

Claim 1 recites a first robot for holding and taking out a container containing objects positioned therein from the first process, and for conveying and positioning the held container at a predetermined position; and a second robot for holding and taking out an object contained in the container held by said first robot and for conveying the held object to the second process, said predetermined position being within an operation range of said second robot.

In contrast to claim 1, Nelson does not disclose a second robot conveying the held object to the second process. In Nelson an Operator loads a pod 815 containing wafers onto a load elevator 838. The load elevator 838 delivers the pod 815 to a conveying section 850. In the conveying section 850 the pod 815 is delivered to an elevator 900. From the elevator 900, a transfer robot 970 removes the wafers 818 from the pod 815 and puts the wafers 818 in a carrier 990. Then a process robot 1000 moves the carrier to process chambers 1020 or 1030. The transfer robot 970 of the Nelson corresponds to the second robot recited in claim 1. As shown, the transfer robot 970 of Nelson does not convey the held objects to the second process but rather puts the objects (wafers 818 of Nelson) into a carrier that is then conveyed by another robot (process robot 1000 of Nelson) to the second process.

Claim 12 recites a first robot for holding and taking out a container from the second process, and for carrying and positioning the held container at a predetermined position; and a second robot for sequentially holding and taking out objects from the first process and placing the objects in the container held by said first robot according to a predetermined pattern, wherein said first robot conveys the container in which the objects are placed to the second process. Similar to the arguments made for claim 1, claim 12 patentably distinguishes over Nelson.

Claim 24 recites holding and taking out a container containing objects positioned therein from the first process, and conveying and positioning the held container at a predetermined position within an operation range of a second robot, using a first robot; and holding and taking out an object contained in the container held by the first robot, and conveying the held object to

the second process using the second robot. Similar to the arguments made for claim 1, claim 24 patentably distinguishes over Nelson.

Claim 35 recites holding and taking out a container from the second process, and for conveying and positioning the held container at a predetermined position using a first robot; sequentially holding and taking out objects from the first process and placing the objects in the container held by said first robot according to a predetermined pattern, using a second robot; and conveying the container in which the objects are placed to the second process by the first robot. Similar to the arguments made for claim 1, claim 35 patentably distinguishes over Nelson.

Withdrawal of the foregoing rejection is requested.

Claims 2, 13, 25 and 36

Claim 2 recites, in part, a second robot with a sensor, for holding and taking out an object contained in the container held by said first robot by recognizing a position and/or an orientation of the object using the sensor, and for conveying the held object to the second process, said predetermined position being within an operation range of said second robot.

In contrast to claim 2, Nelson does not disclose a sensor recognizing a position and/or orientation of the object using the sensor. In Nelson, the only scanner arguably connected to the transfer robot 970 (corresponding to the second robot of claim 2) is the reader/scanner 980 discussed at column 19, line 31 of Nelson. As the transfer robot 970 already has control of the wafer 818 when it scans the wafer, the reader/scanner 980 of Nelson cannot be a sensor recognizing a position and orientation of an object as is recited in claim 2.

Claim 13 recites, in part, a second robot with a sensor, for sequentially holding and taking out objects from the first process and placing the objects in the container held by said first robot by recognizing a position at which the object is to be placed using the sensor. Similar to the arguments made for claim 2, claim 13 patentably distinguishes over Nelson.

Claim 25 recites, in part, holding and taking out an object contained in the container held by the first robot using a second robot by recognizing a position and/or an orientation of the object using a sensor provided at the second robot, and conveying the held object to the second process by the second robot. Similar to the arguments made for claim 2, claim 25 patentably distinguishes over Nelson.

Claim 36 recites, in part, sequentially holding and taking out objects from the first process and placing the objects in the container held by said first robot using a second robot by recognizing a position at which the object is to be placed using a sensor provided at the second robot. Similar to the arguments made for claim 2, claim 36 patentably distinguishes over Nelson.

Withdrawal of the foregoing rejection is requested.

Claims 3-11, 14-23, 26-34 and 37-46

Claims 3-11, 14-23, 26-34 and 37-46 depend on one (or two) of claims 1, 2, 12, 13, 24, 25, 35 or 36, respectively, and are therefore believed to be allowable for at least the foregoing reasons.

Withdrawal of the foregoing rejection is requested.

NEW CLAIM

Claim 47 has been added to provide an alternate recitation of the present invention. No new matter has been added.

CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

Serial No. 10/692,801

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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